—which red seems indefinitely permanent if the wing be removed and dried. It will be seen that, in the table of yellows, several species are marked as showing the "cyanide effect"; whilst others are marked "no cyanide effect." The former are those in which I have succeeded in obtaining the reddening;[1] the latter will not redden. Now, since the former are all known to be pigmental yellows, whilst one of the latter, viz. *T. pronuba*, is the doubtful case, it seemed probable that this cyanide reaction might take place *always and only* with pigments, and thus afford the desired criterion. But in extending my experiments this hope proved fallacious, for I found—as is noted in the table—that various pigment yellows gave no reaction: the typical case on which I relied was *C. hera lutescens*: had this yellow, which is assuredly pigmental, although quite insoluble, been reddened, I should have felt justified in accepting the criterion. But not the slightest reaction took place with this species. I must not linger longer on this certainly fascinating subject: it is clearly one that requires thoroughly working out, and my investigations thereupon, are being carried on in several directions; but I may point out the great interest attaching to a reaction by which we can produce a coloric change practically identical (at least in its effects) with that which progressive evolution has produced in many species formerly yellow but now red.

Before, however, quitting yellow, there are one or two points yet that need explanation. In group 2 in the table, I have included two species showing a rich orange colour: this, though clearly marking a considerable progress in coloric evolution from the presumably primæval pale yellow, is yet *exceedingly soluble*: these instances, which, therefore, are very comparable with the red of *Delias*, are another proof that advance in depth and richness of colour is not necessarily always accompanied by decreasing solubility. I may add that I do not regard the orange of these two species as being in the direct line of evolution from yellow to red, but rather as a collateral or branch line also springing from yellow.[2] It is specially interesting that in this circumstance, as also in so many others, there is an exact parallel among the chestnuts.

And lastly, among the phenomena of yellow, we have to deal with the reaction of *Argia galathea*, already referred to; a reaction in which, contrary to all other experience, a white wing is changed to yellow by various reagents. It is very evident that, since I deny the existence of any pigment in white wings, and assert the yellow to have been developed in a previously unpigmented wing, and not by evolution from a white pigment, it is all-important for me to clear up this matter. My explanation, which has been given in some detail in the *Entomologist* (xxiii., pp. 341–43), is—to be as brief as possible—the following. It is, of course, well known that the pigments of both animals and plants are decomposition products of the protoplasm, whether produced directly by decomposition of the protoplasmic molecule, or indirectly by union of two or more decomposition products. Now, I take it that in this species—*A. galathea*—the metabolic processes have not yet produced any pigment, *but very nearly so*; that there exists in the wing a very unstable *mother-substance* (itself a decomposition product, whether produced immediately from the protoplasmic molecule, or indirectly from a molecule of intermediate complexity); and that the action of any powerful reagent is to decompose this, forming the yellow pigment; which pigment, as soon as formed, commences to dissolve in the reagent, as so many normal yellows do.[3] This view, although at present necessarily somewhat hypothetical, appears to me to offer a satisfactory explanation of the apparently anomalous behaviour of *galathea*.

F. H. PERRY COSTE.

(*To be continued.*)

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[1] I have also obtained it with *Loxura atymnus*. It is very significant that I have in no case obtained it among the Heterocera (moths), but only among the Rhopalocera. Cp. *infra*, on chestnut.

[2] It is very interesting that the orange of *G. cleopatra* first of all is changed to the ground yellow, and then dissolved.

[3] I may point out that in the female of *A. galathea* there is already a cream tint in the wings.

NOTES.

MR. ALFRED RUSSEL WALLACE AND MR. EDWARD WHYMPER are to receive the Royal Medals of the Royal Geographical Society at its annual meeting on May 23 next. The annual dinner of the Society will be held on the evening of that day after the annual meeting. The annual *conversazione* will take place about the middle of June in the South Kensington Museum.

MR. CHARLES HOSE, Resident on the Baram River, in the Rajahship of Sarawak, has recently explored that river to its sources, and ascended Mount Dulit, one of the summits of the main range which traverses this part of Borneo, to a height of 5000 feet. His zoological collections, which have been forwarded to the British Museum, contain many fine novelties. Among the mammals, which were described by Mr. Oldfield Thomas at the last meeting of the Zoological Society, are representatives of a new Carnivore of the genus *Hemigale*, two new Insectivores of the genus *Tupaia*, and a new Squirrel. The birds, which are being worked out by Dr. Bowdler Sharpe for *The Ibis*, likewise contain several remarkable new forms, amongst which is a new species of the restricted Eurylæmine genus *Calyptomena*, intermediate in size between *C. viridis* and the large *C. whiteheadi* of Mount Kina-balu. Mr. Hose is a nephew of Dr. G. F. Hose, the Bishop of Singapore and Labuan.

AMONG the names attached to the recent protest of members of the corporation and teaching staff of University College, London, against the Gresham Charter, we notice the following representatives of science and Fellows of the Royal Society:—Sir F. Abel, Prof. I. B. Balfour, Sir Henry Bessemer, H. S. Caxter, Sir J. N. Douglass, W. T. Thiselton-Dyer, Prof. W. H. Flower, Prof. E. Frankland, Dr. George Harley, R. B. Hayward, H. Hudleston, Prof. T. H. Huxley, Prof. E. Ray Lankester, Prof. Norman Lockyer, Prof. O. J. Lodge, Sir John Lubbock, Prof. D. Oliver, Prof. J. Prestwich, Prof. G. J. Romanes, Sir Henry Roscoe, Prof. Burdon Sanderson, J. Wilson Swan, Prof. Sylvester, E. B. Tylor, and Prof. W. F. R. Weldon. The protest contained equally influential names in the fields of literature, art, and politics; thus forming a document having no small weight in the final decision of the Government regarding this futile attempt to solve the problem of a Metropolitan University.

WE regret to have to record the death of Sir William Bowman, F.R.S., the eminent ophthalmic surgeon. He died of pneumonia at Joldwynds, his house near Dorking, on Tuesday last. He was born on July 20, 1816. In 1840 he was elected assistant surgeon at King's College Hospital, where he afterwards became full surgeon. He was also for a time assistant surgeon, and then full surgeon, at the Royal London Ophthalmic Hospital. He acted as the first president of the Ophthalmological Society of Great Britain, which he helped to found; and in 1884 he was created a baronet in recognition of his professional eminence. Sir William was a master of the various methods of ophthalmic surgery, and did much to improve them and to place them on a sound scientific basis. He held a leading place among those who made accessible to English students the knowledge obtained by the invention of the ophthalmoscope; and to him belongs the honour of having overcome the hostility with which Von Graefe's operation of iridectomy for the cure of glaucoma was received by some authorities in this country. He also devoted much attention to the treatment of obstructions of the tear passages, and to improvements in the operation for cataract. His microscopic work, so early as 1840, was recognized as work of high value. He was elected a Fellow of the Royal Society in 1841, and received one of the Royal Medals in 1842. He was a member of many other scientific Societies both at home and abroad, and honorary degrees were conferred upon him by the Universities of Cambridge, Dublin, and Edinburgh.

DR. R. THORNE THORNE, F.R.S., will succeed Dr. George Buchanan, F.R.S., as medical adviser to the Local Government Board.

PROF. LODGE has, with the approval of the Senate, appointed to the demonstratorship in electrotechnics at University College, Liverpool, Mr. Francis Gibson Baily, late Scholar of St. John's College, Cambridge. Mr. Baily took first-class honours in the Natural Science Tripos, and is now in the employ of Messrs. Siemens Bros. and Co.

THE *Revue Scientifique* notes that at Kieff there is a chemist who is nearly as old as the late M. Chevreul was at the time of his death. This is Prof. Ignace Vonberg, who was born at Vilna on January 17, 1791. He was one of the last Professors of Chemistry at the old University of his native place, and afterwards held, until 1866, a similar position at the University of Kieff. He is said to enjoy excellent health.

IT has been decided, according to Norwegian newspapers, that Dr. Nansen's North Pole Expedition shall start on January 1, 1893. He has selected as members of the Expedition a young officer in the Royal Norwegian Navy, Herr Sigurd Scott-Hansen, who will make the astronomical observations, an experienced Arctic navigator, Captain J. Ingebrigtsen, from Tromsö, and Herr Sverdrup, by whom Dr. Nansen was accompanied in his journey across Greenland.

EVERYONE who occasionally visits the Zoological Gardens was sorry to hear of the death of the giraffe. Since May 24, 1836, the Gardens have never until now been without one of these interesting animals. Dr. P. L. Sclater, writing to the *Times* on the subject, says that during the past fifty-five years there have been in the Gardens thirty giraffes, of which seventeen have been bred and reared there. A male born on April 22, 1846, lived in the Gardens nearly twenty-one years. These facts prove, as Dr. Sclater says, that this animal (one of the most extraordinary forms among recent mammals) is quite fitted for captivity, and is well worthy of the expense and trouble incurred in its keep. The closure of the Soudan by the Mahdists has prevented the importation of giraffes for some years, and for the only individual now in the market (an old female) a prohibitive price is asked. The Zoological Society hope that the need may be supplied by some of their friends and correspondents in Eastern or Southern Africa.

DR. B. W. RICHARDSON will deliver at the Royal Institution his Friday evening discourse on "The Physiology of Dreams" on April 29, in place of Dr. William Huggins, who will give his lecture on "The New Star in Auriga" on May 13.

PROF. W. G. OWENS writes to us from Bucknell University, Lewisburg, Pa., U.S., that on March 15, at 2 o'clock p.m., a series of halos and parhelia appeared and increased in brilliancy until 4 o'clock, after which they faded gradually till sunset. The circles, arcs, and spots around the sun were highly coloured, sometimes showing almost the entire spectrum.

THE Report of the Meteorological Council for the year ending March 31, 1891, has recently been issued. The following changes relating to organization were under consideration during the year: (1) the purchase of a new house near Cahirciveen, to which it is proposed to move the Observatory from the island of Valentia, the former place being more suitable for observations; (2) the registration of the Council as a corporate body, under section 23 of the Companies' Act, 1867; (3) examination of clerks, keeping as far as practicable to the system followed in the Civil Service. The practice followed by the Office with reference to observers at sea remains unchanged. The number of voyages for which logs have been returned during the year was 156; instruments have also been supplied to various islands in the Pacific, &c. In the weather forecasting branch, a comparison of the forecasts issued at 8.30 p.m. during the year with the weather actually experienced, shows that the total percentage of success was 82. The results were best, 88 per cent., for the south of England, and worst, 77 per cent., for the south of Ireland. The hay harvest forecasts were very successful; as much as 95 per cent. of success was attained in some parts. To add' to the means of obtaining warnings of stormy weather at exposed fishery stations, the useful practice of lending trustworthy barometers, adopted by Admiral FitzRoy, has been continued; the number of stations now supplied is 180. The subject of cloud photography has continued to receive attention, and the system of observation and reduction has been improved, so that there is reason to expect that satisfactory determinations both of the heights and the velocities of the various clouds will be made. The Council have requested Mr. W. H. Dines to carry out a series of experiments at Oxshott for the purpose of comparing the action of various forms of anemometers, as well as experiments on the resistances of curved plates and vanes. The work is nearly finished, and the results will be published.

THE *Deutsches meteorologisches Jahrbuch*, Bavaria, 1891, Heft 3, contains twelve cloud pictures, reproduced from photographs supplied by Hildebrandsson, Riggenbach, and others. These photographs have been collected by Dr. Singer, of Munich, who submitted some of them to the International Meteorological Conference held there last autumn, where the importance of the artistic representation of clouds was discussed. The Cloud Atlas, published at Hamburg in 1890, was recognized by a large majority as the first satisfactory attempt to obtain uniformity in cloud nomenclature; but a Committee was framed to further consider the future production of pictures in a cheap form, according to the types approved by the Conference, and Dr. Singer was asked to join that Committee. The pictures now in question may be considered as his contribution to the subject. The forms are well defined; the names proposed differ materially from the classification by Luke Howard, hitherto generally in use, more attention being paid to the average heights of the various types. There are, however, still distinct variations of cloud frequently seen, which are not represented in Dr. Singer's collection, and his system of classification, notwithstanding its merits, has defects which must, sooner or later, be dealt with.

THE *Times* of March 24 printed the following communication from a correspondent:—Under the direction of the Austrian Government an interesting series of deep-sea explorations has been conducted recently in the eastern parts of the Mediterranean, by a scientific party on board the *Pola*. At one point, about 50 nautical miles south-west from Cape Matapan, the *Pola* found a depth of 4400 metres (2406 fathoms), followed within a few miles further east by a depth of 4080 metres (2236 fathoms), which are the greatest depths recorded in the Mediterranean. They have received from the Austrian Hydrographical Board the name of Pola Deep. The great depression of the Mediterranean must thus be shifted considerably east from its former central position on the maps. Another deep area was explored between Candia and Alexandria—the depths attaining from 3310 metres (1810 fathoms) some twenty miles south-east of Grandes Bay, and from 2392 metres (1208 fathoms) to 2120 metres (1322 fathoms) within a short distance from Alexandria; the maximum depth sounded being 3068 metres (1678 fathoms) in 28° 39′ 30″ north latitude, and 33° 19′ 54″ east longitude. The highest temperature was found during the first part of the voyage, at depths of 1 to 50 metres, the highest being 80°·8 Fahrenheit at 1 metre; the lowest temperature, 52½°, was observed at the issue from the Adriatic Sea, at a depth of 760 metres. In explorations conducted some two years ago in the Central Mediterranean, it was observed that the density of the water and its saturation with salt increased with depth, and the same was noticed in the western part of this year's cruise. But in the Eastern Mediterranean the density of water varies but very little in the different strata, and it is higher on the whole than in the west. The transparency of the water is very great in the Eastern Mediterranean. Altogether the *Pola* made no fewer than 50 deep-sea soundings, 27 of which touched depths of more than 1000 metres.

AT a meeting of the Royal Geographical Society on Monday, a paper describing a recent journey to the head waters of the Ecayali, Central Peru, by Mr. Alexander Ross, was read by Sir Alfred Blunt. The journey was undertaken by desire of the Peruvian Corporation. Mr. Ross was accompanied by Mr. Arthur Sinclair, who, like himself, had spent many years planting in Ceylon; and, for research in economic botany, by Mr. P. D. G. Clark, assistant at the Royal Botanic Gardens, Peradeniya, near Kandy, Ceylon. Their travels lasted five months, and were confined to the central portions of the interior. Mr. Ross said that not much of the Sierra visited by them was suited to modern systems of tillage. But in the Montaña there were vast areas at suitable altitudes well adapted for settlement by European immigrants. In the lower parts of the Amazon basin, in a climate more or less unsuited to white labour, immense tracts awaited only the introduction of Chinese or the Indian coolie to turn what was now a magnificent forest wilderness into a rich and thriving province. The Central Railway would have been completed to Oroya in June next, and the Chanchamayo road would be opened soon thereafter. In continuation of these, and to connect them with the navigable waters of the Amazon, the survey of a railway line had already been ordered. The immense influence these would have upon the future of Peru and its progress would then become apparent. At present, to those who had not seen that country's varied and unlimited mineral resources, its grand forests, its rich soil and splendid rivers, a full realization of the future of Peru was impossible.

AT a meeting of the Royal Botanic Society on Saturday last, the Secretary, in calling attention to the various examples of azaleas in flower from the Society's Gardens shown at the meeting, remarked upon the many intermediate forms represented between the single and so-called double varieties. In some the stamens were only beginning to assume a flattened shape, the anthers still remaining at the top; in others, again, following the usual course of formation of double flowers—namely, by alteration of parts instead of adding to their number, the whole of the internal organs had become changed into petals, depriving the plant of all opportunity of reproducing itself by seed.

THERE is some difference of opinion in America on the question whether the method of execution by electricity ought to be maintained. The American journal *Electricity* maintains strongly that it should. The newspaper reports as to the electrical executions which have already taken place go to show, it contends, that death has been almost instantaneous in every case. While this has been disputed by a few witnesses, almost all have conceded that loss of consciousness has followed immediately on the application of the current. "The muscular action which has been noticed cannot for a moment," says *Electricity*, "be attributed to any consciousness on the part of the criminal. It is purely a reflex nervous action which can be reproduced by applying a current to the nerves of an animal which has been dead for some time; in fact, a most vigorous muscular action can be set up in a dead body in this way. That the victim, however, is alive, or that he suffers pain in any degree, is not for a moment to be considered."

THE new number of the *Economic Journal* contains, among other things, the Rev. Prof. W. Cunningham's inaugural lecture delivered at King's College, London. It is on the relativity of economic doctrine, and is conceived in a thoroughly scientific spirit. In the course of his argument, Prof. Cunningham urges that the results of economic investigation are relative in a way in which the results of physical investigation are not. The physicist announces principles which hold good, without substantial modification, for the whole period of human existence on the globe; whereas there are areas, and probably periods of human existence, to which the very simplest economic principles are hardly applicable, since there are tribes which seem to be destitute of ideas of exchange. The movement of the earth, the principle of gravitation, are entirely independent of human existence and unmodified by its changes. Economic principles, on the other hand, are statements about human nature in some of its aspects; and the alterations in the human race, their habits and practices, cannot be left out of account, more especially as the economic side of life occupies a very different importance at different stages of human progress. In consequence of this distinction between economical and physical investigation, results that may be used as the bases of practical applications cannot be as readily obtained in economics as in physics. The art of navigation follows very closely on the observations and principles expounded by the astronomer, but there is need of much correction and allowance before the principles of the economist can be applied by the statesman to steer his course in regard to the details of any great social measure.

PROF. G. H. WILLIAMS, in an interesting paper printed in the latest of the "Johns Hopkins University Circulars," speaks of the important part played in the growth of geological opinion by those regions which happen to be near great Universities. Such districts, as he says, were naturally earliest and most thoroughly studied, and have therefore become classical for all subsequent comparison. He especially mentions the mining districts of Freiburg and Clausthal, the volcanic regions of Edinburgh and Bonn, and the Tertiary basins of Paris and Vienna. These have become, once for all, the type-localities for the geological formations which surround them. Such masters as Werner, Hutton, von Dechen, Cuvier, and Suess, have worked there, erecting monuments to themselves in the regions which they have interpreted. Prof. Williams's practical conclusion is that Maryland, which, from a geological point of view, is full of interest, ought to be thoroughly investigated by geologists connected with the Johns Hopkins University.

THE Council of the Mason Science College, Birmingham, append to their report for the year ended February 23, 1892, some interesting extracts from a report by the Principal on the educational work of the College. From these we are glad to learn that the year, although marked by no new and striking developments of the College work, was throughout a year of continued prosperity, both in regard to the number of systematic students attending the College classes and the excellence of the work done, as testified by the honours won at various University examinations. There was a decrease in the number of students attending the departments of zoology, botany, metallurgy, and engineering, but a large increase in connection with the departments of modern languages, geology, chemistry, physics, and physiology.

THE Rugby School Natural History Society has now been at work for twenty-five years, and its report for the year 1891 shows that it is still full of vigorous life. The geological section, which lapsed ten years ago, has made a fresh start, and the meteorological, the architectural, and the photographic sections are stated to be "in a flourishing condition." The editors have added to the report an index of all the papers and records which have been published by the Society from the beginning.

WITH regard to the influence of electricity on the growth of plants, a series of experiments made by Prof. Aloi on *Lactuca Scariola*, maize, wheat, tobacco, and beans, indicate that atmospheric electricity exercises a beneficial influence on vegetation; that the electricity of the soil has a similar influence on the germination of seeds; and that the less luxuriant vegetation of plants which grow in the neighbourhood of trees is in great part due to the diminution of temperature.

THE effects of earthquakes on vegetation have been investigated by Signor A. Goiran, in the case of the seismic disturbances which occurred last June throughout Northern Italy. He found in this instance the uniform result to be to induce a more rapid germination of seeds, and a more rapid growth of the young plants, giving rise to a more luxuriant vegetation in the pastures, arable lands, vineyards, and shrubberies, accompanied by an unusually deep green colour of the leaves. These results he believes to be due, not to the direct influence of the tremor, but to three secondary causes, viz. (1) an increased production of carbon dioxide; (2) a diffusion of nutrient fluids through the soil, acting as a kind of natural manuring; (3) an increased production of electricity. In other instances earthquakes have apparently had an unfavourable influence on vegetation; but this Signor Goiran believes to be due to their having been associated with a long period of drought.

OF the recently published *Indian Museum Notes* one of the most interesting papers is on the wild silk insects of India. It is by Mr. E. C. Cotes, and is intended to serve as a supplement to a previous paper on cultivated silk-producing insects. A small amount of silk is spun by the caterpillars of most moths. The only groups, however, which contain species whose silk is at all suited for utilization are the Saturniidæ and the Bombycidæ, and the whole of the Indian species belonging to these groups, therefore, have been included in the present report, though many of them do not produce sufficient silk to be of any use. So much, however, has of late years been said about the wild silk insects of India, and such exaggerated opinions have been expressed as to their value, that it has been thought best to deal exhaustively with the matter, so as to clear the ground and show precisely how the question really stands.

THE Royal Agricultural and Commercial Society of British Guiana has been discussing the question whether an Agricultural College should not be established in the colony. At a recent meeting Mr. Jacob Conrad brought forward a motion to the effect that a Committee should be appointed to petition the Government on the subject. He failed, however, to obtain the support of a majority. Mr. Darnell Davis thought it desirable that the question should be discussed, but could not see how anything practical would come out of it unless some kind philanthropist found the money. Agricultural Colleges were very expensive, and he did not think the Government could be asked to do anything, as it would mean the imposition of additional taxes. He thought that every sugar plantation in the colony was really an agricultural school.

MRS. ZELIA NUTTALL contributes to the new number of the *Internationales Archiv für Ethnographie* a learned and interesting paper on ancient Mexican shields. She divides them into the following groups:—(1) Plain, unadorned war-shields of several kinds, used by the common soldiery. (2) Gala-shields, indicating the military rank and achievements of chiefs. These seem to have been indiscriminately used in warfare or feasts and dances. Their general structure seems to have been alike in either case, though they may have been more or less light and strong. Shields of this category sometimes reproduced one or more features of the military costume, body-painting, and adornments pertaining to each grade. (3) Shields, presumably of the supreme war-chief, exhibiting in picture-writing the name of his people or his personal appellation. Nothing certain is known about this group, but its existence seems vouched for by a series of indications. (4) Shields pictured in the codices with deities only, exhibiting their emblematic devices or reproducing features of their symbolic attire. Such shields seem to have been carried, in religious dances and festivals, by the living images of the deities in whose honour they were celebrated. (5) Shields of most precious materials, with strange and elaborate designs, described in the inventories. As they are not mentioned elsewhere, it is not possible to state anything definite about them, but it is obvious that they were intended for the use of individuals of supreme rank. The beautiful shield preserved at Castle Ambras, near Innsbruck, belongs to this group. It is the only known specimen with a valid, though shadowy, right to the title of "Montezuma's shield."

ACCORDING to Mr. A. Sidney Olliff, who writes on the subject in the *Agricultural Gazette of New South Wales*, the "metropolis" of the plague locust of New South Wales is in the western district, especially in the great plains between the Lachlan and the Darling Rivers. The breeding-grounds of locusts in Australia are as extensive as those of the Rocky Mountain locust, and are found in similar situations. The eggs are deposited in vast quantities in the earth, close beside one another, frequently over a large tract of country. Usually these breeding-grounds occur in sandy soils or in high dry places, but occasionally they may be found on the banks of a creek. At the end of September last, during a hurried visit to Renmark, in South Australia, Mr. Olliff found the bare sandy banks of a small creek riddled with small holes from which the newly-hatched locusts had but just escaped. Swarms of young locusts had previously been observed by him near Wentworth, making their way from the bare places in which they were hatched to the richer pasturage. The U.S. Entomological Commission has carefully investigated the various ways in which these pests can be most effectually dealt with; and a condensed account of the results is presented by Mr. Olliff for the benefit of Australian farmers.

THE Marine Biological Association, Plymouth, has issued a new price-list of zoological specimens. This cancels the previous list. The specimens are suitable for class or laboratory examination, and for museum purposes. They are kept in stock at the Plymouth Laboratory, and are to be obtained on application to the director.

THE following arrangements have been made for science lectures at the Royal Victoria Hall during April:—April 5, Henry M. Bernard, on "Life in Russia"; April 12, A. H. Fison, on "The Compass Needle"; April 26, Captain Charles Reade, on "The British Navy."

MESSRS. MACMILLAN AND CO. have issued the sixth edition of Sir Henry E. Roscoe's well-known "Lessons in Elementary Chemistry." The fifth edition, which has been repeatedly reprinted with slight corrections, was published in 1886. The author has tried to introduce into the present edition all the more important discoveries of the last six years, and to make such general improvements as he has thought likely to be of benefit to his readers.

THE April number of *Natural Science*, the new monthly review of scientific progress, has articles on factors in the evolution of the Mammalia, by Prof. C. Lloyd Morgan; some salient points in the study of mammals during 1891, by R. Lydekker; the physical features and geology of Borneo, by F. H. Hatch; great lakes, by Clement Reid; life-zones in Lower Palæozoic rocks, by J. E. Marr, F.R.S.; and a new group of flowering plants, by A. B. Rendle.

MESSRS. KEGAN PAUL, TRENCH, TRÜBNER, AND CO. have issued a second edition of Mr. B. H. Chamberlain's "Things Japanese." The work consists of a number of independent articles, arranged alphabetically, and giving an account of the Japanese people, their country, their ideas, and their industries. It has been enlarged by the insertion of over twenty new articles, while the old have been corrected up to date, and re-written in many parts. The style is compact, fresh, and lucid, and at the end of the more important articles the author gives a list of books in which further information may be obtained. Several subjects have been intrusted to specialists. Prof. Milne contributes the article on "Geology," and Mr. Mason those on "Telegraphs," "Chess," and the game of "Go."

THE "School Calendar" for 1892 has been published, this being the fifth year of issue. Mr. F. Storr, referring in the preface to the movement for the registration of teachers, notes that head masters who have hitherto ignored or sneered at the teaching diplomas of the University of Cambridge are beginning to send up their assistants for the examinations of the Syndicate, or even to enter themselves.

THE new number of *L'Anthropologie* (tome iii., No. 1) opens with an interesting paper on A. de Quatrefages, by Émile Cartailhac. The paper is followed by a useful list of the principal publications by M. de Quatrefages. M. Marcellin Boule contributes some excellent notes on the formation of fossiliferous deposits in caves. There are also papers on the tumulus-dolmen of Marque-Dessus (commune d'Azereix, Hautes-Pyrénées), by General Pothier; on the respective association of anthropological characters, by Dr. R. Collignon; and on the ethnological position of the peoples of Ferghanah, by Paul Gault.

THE U.S. Geological Survey has lately issued a number of important papers in its series of *Bulletins*. One of them (No. 69) contains a classed and annotated bibliography of fossil insects; another (No. 71), an index to the known fossil insects of the world, including Myriapods and Arachnids. No. 72 gives the altitudes between Lake Superior and the Rocky Mountains; No. 74, the minerals of North Carolina; No. 75, a record of North American geology for 1887 to 1889 inclusive; No. 79, an account of a late volcanic eruption in Northern Carolina, and its peculiar lava. No. 76 is the second edition of a dictionary of altitudes in the United States.

WE have received Parts 41 and 42 of Cassell's "New Popular Educator." Both, like the previous parts, are carefully illustrated. In addition to the cuts introduced into the text, Part 41 has a coloured picture of "the Spectre of the Brocken," and Part 42 a coloured map of the Balkan Peninsula.

THE Hunterian Oration, delivered by Dr. J. Hutchinson, F.R.S., in the theatre of the Royal College of Surgeons on February 14 last, has now been published by Messrs. J. and A. Churchill.

THE additions to the Zoological Society's Gardens during the past week include a Macaque Monkey (*Macacus cynomolgus* ♂) from India, presented by Mr. F. D. Lyon; a Rhesus Monkey (*Macacus rhesus* ♀) from India, presented by Mr. J. G. Wythe; a Brush Bronze-winged Pigeon (*Phaps elegans* ♀) from Australia, presented by Mr. H. H. Sharland, F.Z.S.; two Red Kangaroos (*Macropus rufus* ♀ ♀) from Australia, deposited; two Great American Egrets (*Ardea egretta*), two Snowy Egrets (*Ardea candidissima*) from America, two Buff-backed Egrets (*Ardea russata*), European, purchased; an Eland (*Oreas canna* ♂), born in the Gardens.

OUR ASTRONOMICAL COLUMN.

THE PLANET JUPITER.—During the last year or so the planet Jupiter has been the subject of many observations both at home and abroad. The curious markings that become visible from time to time have been very carefully watched, and the changes which they have been seen to undergo likewise recorded. Those who take a special interest in these observations will find in *L'Astronomie*, under the title of "Recent Discoveries on Jupiter," a most excellent article written by M. Camille Flammarion. The author, after giving a description of the general state of the planet that can be gathered from a telescopic and spectroscopic survey of his surface, adds a *résumé* of the important observations made by M. Terby, at Louvain, which were originally addressed to the Belgian Academy. Many very important facts relating to the positions which the dark and light spots take up are here collated, and the numerous illustrations impress one strongly with the vastness and rapidity of the changes that are continually in progress.

Astronomy and Astro-Physics for March contains also some notes on this planet, communicated by Mr. H. C. Wilson, of the Goodsell Observatory, who, armed with a 16-inch equatorial during the winter of 1891, completed many sketches, some of which are here exhibited. These observations seem to indicate that as the dark belt approached the great red spot which is situated just north of it, the latter appeared to force it to one side, "there being always a very narrow line of white between the belt and spot." This fact seems to show that, whatever the spot may be composed of, it has the power of dissipating the clouds in close proximity to it.

THE OBJECTIVE PRISM.—Prof. Pickering, in the March number of *Astronomy and Astro-Physics*, communicates a very interesting article relative to the method of photographing the spectra of the stars with an objective prism. As an account of this method has already been described in these columns in the review of the catalogue published under the name of "The Draper Catalogue," it is unnecessary for us to enter into the details again. At the latter end of the article he mentions also that "a still further advance will be made with the great photographic telescope, the gift of Miss C. W. Bruce." This instrument is stated to be similar to the "Bache telescope," but three times as large, having an aperture of 24 inches. The spectra of stars down to the 10th and 11th magnitude are expected to be obtained with it. The engraving which accompanies the text illustrates the method of attaching the large prism to the object-glass end of the telescope.

VARIATION OF LATITUDE.—Dr. B. A. Gould, in the *Astronomical Journal*, No. 257, presents us with some of the work which he has been undertaking with regard to the periodic variation of the latitude at Cordoba, from observations made with the meridian circle. The results obtained by Dr. Chandler showed that by assuming a period of fourteen months, the variations in the latitude, determined between the years 1860 and 1875, could be accounted for. Dr. Gould thought that the same period might be found to satisfy the Cordoba observations, and the computations that he has made form the subject of the present inquiry. Owing to the fact that this number of the *Journal* does not contain the whole of the work (the latter part of which will be concluded in the next one), we are not able to give the results which he has obtained, but we can mention a point that seems of importance, and which tends to corroborate Dr. Chandler's results.

In a table showing the mean excess of the calculated, above the observed, declinations, the author remarks that "there are two facts which attract attention: first that the times of maxima and minima of the curve are approximately coincident with those deduced by Dr. Chandler from contemporaneous observations in other places; and, secondly, that the corresponding